

INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 2003	Park: Shenandoah NP						
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Name: Alissa Packer	Phone: (570) 372-4217	Email: packer@susqu.edu					
Permit#: SHEN-2003-SCI-0015							
Park-assigned Study Id. #: SHEN-00290							
Project Title: The Role of Belowground Plant-Microbe Interactions in Plant Invasions							
Permit Start Date: Oct 15, 2003	Permit Expiration Date Aug 26, 2005						
Study Start Date: Oct 15, 2003	Study End Date Aug 26, 2005						
Study Status: Terminated before completed							
Activity Type: Research							
Subject/Discipline: Ecology (Aquatic, Marine, Terrestrial)							
Objectives: Objective The objective of this project is to contrast the role of soil microbes, especially pathogenic fungi, in regulating the growth, survival, and ultimately the distribution of black cherry (<i>Prunus serotina</i>) trees in their native and non-native ranges. This study will test the hypothesis that resident soil microbial communities from the native range of <i>Prunus</i> will have a negative effect on <i>Prunus</i> , but resident microbial communities from the non-native range of <i>Prunus</i> will have a positive or neutral effect on this tree species. I will conduct parallel field studies and greenhouse experiments with soil microbes from the native (U.S.) and non-native (Europe) ranges of <i>Prunus</i> . This cross-continental comparison will consist of the following: 1) culture and identification of soil pathogens, primarily <i>Pythium</i> spp. in invaded and natural forests; 2) experiments testing the effects of soil biota origin, soil community, and individual and complexes of <i>Pythium</i> spp. on <i>Prunus</i> seedlings; 3) spatial distribution measurements of <i>Prunus</i> dispersion within forests. The proposed cross-continental comparison will experimentally test whether resident soil microbes help facilitate invasion of <i>Prunus</i> in its non-native range as a result of escaping from soil pathogens that exist within the natural range of this tree species. Background Previous research reported by my collaborators suggests that soil pathogens reduce the abundance of black cherry and help to maintain tree diversity							

within temperate forests (see attached paper by Packer and Clay in Nature, 2000). A major portion of my research places emphasis on plant-soil biota interactions across the native and non-native ranges of black cherry. Sampling in Shenandoah National Park will dramatically improve our understanding of how black cherry interacts with the soil community within its native range.

Findings and Status:

To test the effect of soil pathogens on black cherry survival, I have identified three sites within Shenandoah National Park and several other areas in the eastern U.S.A. in 2003 (Allegheny National Forest, PA; Great Smoky Mountain National Park, TN; Homochito National Forest, MS; Indiana Dunes National Lakeshore; Indiana University Research Area; Mammoth Cave National Park, KY; San Felasco Hammock Preserve State Park, FL and Torreya State Park, FL). We have decided that other sites are more suitable for our research and will not continue conducting research at Shenandoah National Park.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?

No

Funding provided this reporting year by NPS:

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Funding provided this reporting year by other sources:

12000

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college

Full name of college or university:

Indiana University

Annual funding provided by NPS to university or college this reporting year:

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